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DEVELOPMENT OF BUSINESS MATHEMATICS COUNTING INTEGRATION METHODS IN THE BIG DATA ERA IN FOOD BARN MANAGEMENT

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ABSTRACT

The post-pandemic economic crisis created a journey of ups and downs in business, business and work in the aggregate and individually. The problems faced in agriculture and plantations are: inflation, famine. and post-harvest situations that leave farmers disillusioned. The aim of the research is to develop a solution synergy in the integration space in the business mathematics space. Applied research on experimental tests was carried out using simulated data. This method injects theory into the case through the moving average method and simple comparisons. The results of the analysis are in the form of the first rhetoric given to farmers to answer the problem that the selling price of crops cannot cover agricultural production through 1) the application of a moving average as a sales target that adjusts information on market conditions owned by the local KUD, for farmers of crop yields with a longer expiry date to determine an open and close selling system in an effort to maintain a balanced price between the wishes of farmers and the desires of consumers. Meanwhile for fruit and vegetable farmers, moving averages are used to determine sales targets, not to implement an open and close system because the fruit and vegetable expiration period is faster, but to direct farmers to make decisions to expand the market through simple comparisons in market space, as well as product innovation. The next analysis is the rhetoric for KUD which is a food storage data center that is connected by the government and stakeholders to help farmers remain productive. Meanwhile for fruit and vegetable farmers, moving averages are used to determine sales targets, not to implement an open and close system because the fruit and vegetable expiration period is faster, but to direct farmers to make decisions to expand the market through simple comparisons in market space, as well as product innovation. The next analysis is the rhetoric for KUD which is a food storage data center that is connected by the government and stakeholders to help farmers remain productive. Meanwhile for fruit and vegetable farmers, moving averages are used to determine sales targets, not to implement an open and close system because the fruit and vegetable expiration period is faster, but to direct farmers to make decisions to expand the market through simple comparisons in market space, as well as product innovation. The next analysis is the rhetoric for KUD which is a food storage data center that is connected by the government and stakeholders to help farmers remain productive..

1. INTRODUCTION

After the pandemic and the existence of the world situation in the global economic space which is experiencing an energy crisis, weather crisis, natural ecosystem crisis, affecting many economic problems in the aggregate and individually creating a journey of ups and downs in

business, business and work space which makes daily news saturate the sharing space and search for solutions.

The economic crisis in aggregate and individually is like a chain that cannot be broken from the point of view of correlation in the pattern of economic growth, referring to the theory that economic behavior will emerge because there is a need.

According to Rochmawan (2008: 4), needs are human desires for goods and services that must be fulfilled, and if they are not fulfilled, they will affect their survival or can have a negative impact. (Gunawijaya, R, 2017).

Thus economic growth remains, one after the other. This can be seen from the observation of bankrupt business fields accompanied by new businesses that have risen with good prospects,

Economic growth that is in the growth and development of businesses and work in different fields that respond to the economic crisis forms patterns including the pattern of the wheels of economic growth such as pedaling a bicycle, where on one side the leg decreases and the other leg rises, this can be seen in the business season such as product businesses related to the rainy season and dry season, harvest season and famine season, school holiday season and school entry season, are patterned as a stable line with fluctuations that are not too significant as in the business of primary product sources of energy and food sources, clothing, boards in the category necessity is not an option. It is patterned like a Linear line which fluctuates very much depending on price changes, this is in the secondary and tertiary business space.

The problem is that these economic difficulties remain a complicated thread and the news is still going viral when the economic crisis occurs due to factors: 1) inflation, 2) famine due to crop failure, and 3) post-harvest situation. This happened because to overcome these economic difficulties it was only limited to business, business and work spaces in micro-clusters whose parameters were measured in the scope of individuals, groups, work divisions, institutions or organizations or companies in the industrial, trade and service segments. Therefore, this research tries to synergize solutions to break the box work system through space integration solutions in the mambay aray chain in the agriculture and plantation sector clusters which are facing 1) inflation, 2) famine due to crop failure, and 3) post-harvest situation.

2. METHOD

This research method is divided into several parts.

1. The scope of this research is based on the inflation factor in the post-harvest selling price experienced by farmers, the average price drops drastically so that they cannot cover agricultural production costs because fertilizer prices are expensive, which creates a disappointed attitude of farmers which is sometimes expressed by destroying their own crops.
2. The tools used in this research are theoretical foundations that are tested into applied cases to study its deductive space as an implementation of the results of input or injection of theory into cases in logical analysis through the enrichment of sustainable theory in the field of macroeconomics related to the development of business mathematics in agriculture and plantations
3. The Research Site is an information space related to the response of the farming community to the high price of fertilizer and the low selling price of crops taken from news sources currently viral through social media on the internet.
4. Data collection instruments are in the literacy room in the literature study, as well as case observations about farmers' disappointment when post-harvest occurs in the social media room. Thus the data used is qualitative data in the phenomenon of post-harvest farmers'

disillusionment, and quantitative data in simulation numbers in the experimental test room to explain methods for developing business mathematics in agriculture and plantations.

5. The operational definition of variables in quantitative data is used to show methods for developing mathematical formula calculations in problem solving development methods in cases that use simulated numbers in the experimental test room which are prototypes.
6. The analytical instrument in the theoretical applied research space in the case of developing solutions to overcome inflation, famine due to crop failure, and post-harvest situations in the agricultural and plantation business space is to link the deductive approach in the sorted statistics space (mabay aray), as an applied path to create an integration of data in the space experimental test.

3. RESULTS AND DISCUSSION

The impact of inflation that occurs causes the economic cycle to be affected for those who have vulnerabilities in economic growth individually or in groups in the micro and macro space.

The stage of recognizing those affected by inflation can be seen in the economic growth map from the upstream to the downstream estuary, which can be seen from a series of production chains and production transfers that give rise to handshakes between 1) suppliers (first producers) and buyers (second producers who have a role as traders, services or large manufacturers), 2) the second producer shakes hands with the third producer, namely the next buyer as a medium-sized business in the field of trade, services and partnership companies such as franchise companies, 3) the third producer shakes hands with the fourth producer as the next buyer as a small entrepreneur (grocery stalls, food stalls, small tailors, pulse counters), and 4) buyers as end consumers, namely households.

From the flow of products from the upstream to the downstream estuary, you can see a map of significant economic growth at the grassroots, where working capital and economic activity from the community dominate: 1) small and medium business spaces, 2) partnership spaces (gojek drivers, franchise businesses, pulse counter businesses, catering and others), and 3) permanent purchase of manufactured goods from factories by end consumers in households,

From observations of the flow of product mobilization it appears that the most vulnerable to inflation are: 1) first producers as farmers, plantations, fisheries, livestock, 2) fourth producers, and 3) final buyers. Where their position does not have more alternatives than what can be done by the second and third producers who still have other alternatives when inflation occurs. The general behavior of second and third producers when experiencing financial liquidity problems during inflationary times, will tend to purchase imported raw materials which are cheaper than the rising national raw material prices and reduce staff to increase cost efficiency.

Figure 3. Observation of product mobilization flows that are highly vulnerable to inflation

Design and build problem solving that becomes rhetoric or suggestions

Design and build project solving which is the rhetoric in business development research in the field of agricultural and plantation products focusing on the balance point between agricultural production cost accounting and agricultural production marketing accounting which is synergized in space for reducing idle capacity which makes the point of economic growth stable again or above stable in the agricultural and plantation sectors.

Problem solving is a method that involves a high-level way of thinking to find, change, solve various problems encountered. (Yaumi, Muhammad, in Novaztiar, L, 2016).

Economic growth is also the main benchmark (economic indicator) of the economic achievements of developed countries and the achievements of the economic development of developing countries. On the other hand various macroeconomic indicators are placed in two positions, namely designing several macroeconomic indicators (such as investment levels, interest rates, local currency exchange rates, consumption and production) as locomotives or drivers of economic growth, and making several other macroeconomic indicators (such as unemployment rate, poverty). (Gunawijaya, R, 2017).

The basic design of macroeconomic indicators in the classification of production in this study is directed at the productivity and performance of farmers through accelerated or accelerated search for problem solving in the interests of farmers and the interests of consumers that are not mutually exclusive.

The large diversity of innovations developed adjusts to dynamic economic phenomena such as inflation. Innovation related to patterns of production, marketing, accounting and financial management, as well as the level of language complexity, exchange of money values, negotiations on agreements and guarantees on business, business combinations (consolidation) or partnership business empowerment in joint ventures, franchises, cooperatives, and innovation from digital technology, has completed the multi-complex level of complexity of a work and business process in the business combination zone that forms an encyclopedia of solutions in the field of work and business for each type of producer classification, where ideas for finding solutions to the movement of economic activity in its growth pattern alternately, complement each other either through:

The theoretical basis which is the rhetoric in the development of a variety of innovations cannot be separated from SIM, SIA, Database and Business Mathematics material. And this is a limitation of the scope of research on the development of information technology, through the method of integrating business calculations in the big data era in the field of agricultural and plantation processed products.

First Rhetoric

Thinking strategy is thinking about the future or time, about what to do, what decisions to make, what to spend, what to prepare, what to choose, and what to finish. (Sabariah, Ethics, Strategic Management, 2016)

Suggestions for solving the problems faced by farmers, namely expensive fertilizer but cheap yields, are to use business mathematics, which is a way that farmers everywhere must understand.

One of the calculations is to use: 1) the moving average method as a determinant of sales targets, 2) a time series to determine the estimated future production costs and 3) integrated into a mathematical matrix of order two to determine the estimated profit of farmers on crop yields. Thus the basis for this calculation can be used to make a decision when to sell through an open and close system, where the sales system can be carried out for crops that are sufficient to last a long time in food storage, such as rice, spices, and tubers.

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Meanwhile, garden produce, especially fruit and vegetables, cannot be stacked in the food barn. Thus fruit and vegetable yields are focused on the use of business mathematics related to marketing and product innovation.

Open Close System

Every farmer must carry out food barn management like the times of his previous ancestors which were modernized, through the socialization space so that he is able to organize his agricultural business to be more developed.

In the open-close system sales design, it is an indicator or compass where farmers take wise actions after an abundant harvest. The step taken is to make the food barn at the farmer's house a central profit through barn management. In order to be able to design an open and close sales system for agricultural crops, it is carried out by determining sales targets through the moving average method with the aim of adjusting the selling price according to the conditions or season when the harvest sales activities are carried out.

Organizing food barn bookkeeping by making warehouse cards that use a simple method of calculating the movement of crop inventory depreciation through moving average statistics can be done through a simple application in Microsoft Excel.

The research design that is carried out based on simulated numerical data whose variables are controlled is a category of experimental research.

Experimental research is an attempt to conduct trials (manipulation) of the variables studied. (Suliyanto, 2006).

In this case the variable being tested is the amount of rice harvest in one unit only, namely one farmer who produces 1000 tons where 1 ton is 1000 kg in months 3 (three), months 6 (six), and months 12 (twelve), where it is assumed that harvest Raya one year 3 times.

Eksperimental_1 Pembuatan Kartu Gudang dengan Moving Average
Untuk Kebijakan Target Penjualan Sistem Buka Tutup

Kartu Gudang_Hasil Panen Padi per 3 bulan

Panen_bulan 3 1000 ton
Panen_bulan 6 1000 ton
Panen_bulan 12 1000 ton

Bulan	TON	Estimasi Penyusutan
1	0	#N/A
2	0	#N/A
3	1000	333,3333333
4	0	333,3333333
5	0	333,3333333
6	1000	333,3333333
7	0	333,3333333
8	0	333,3333333
9	1000	333,3333333
10	0	333,3333333
11	0	333,3333333
12	1000	333,3333333
Sisa	33,33333	
10 bulan	333,3333 dalam 1 Thn	

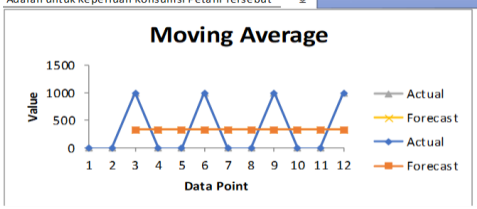
Adalah untuk Keperluan Konsumsi Petani Tersebut

Kartu_bln 3
- Bulan 3_Target Jual 300 Ton
- Bulan 4_Target Jual 300 Ton
- Bulan 5_Target Jual 300 Ton

Kartu_bln 6
- Bulan 6_Target Jual 300 Ton
- Bulan 7_Target Jual 300 Ton
- Bulan 8_Target Jual 300 Ton

Kartu_bln 9
- Bulan 9_Target Jual 300 Ton
- Bulan 10_Target Jual 300 Ton
- Bulan 11_Target Jual 300 Ton

Kartu_bln 12
- Bulan 12_Target Jual 300 Ton
- Bulan 1Target Jual 300 Ton
- Bulan 2_Target Jual 300 Ton



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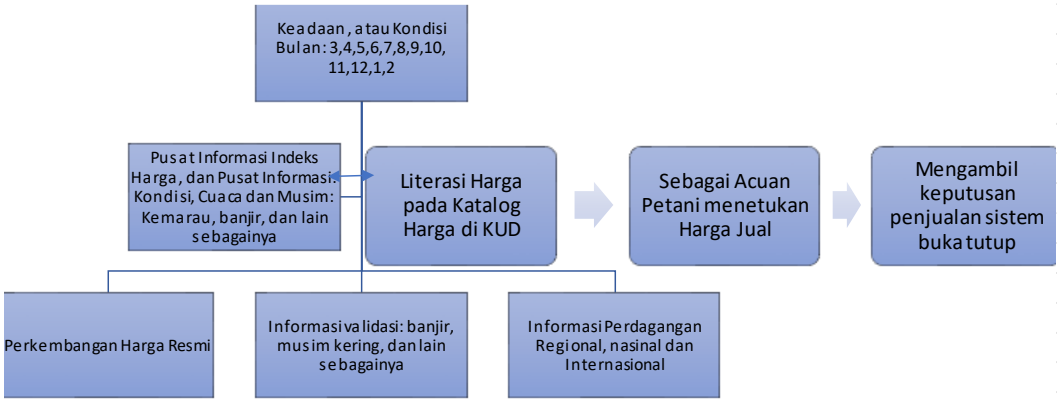

The results of experimental calculations using the moving average method guide farmers to make sales targets in the optimization space. By reading the unclear season (sometimes it rains, sometimes it's dry), reading the possibility of flooding that causes crop failure, reading market needs such as during the festive season, holiday season, Ramadan, holidays and New Years, giving instructions to farmers to act wisely to carry out an open and close sales system, so that the price of the crop does not fall. In general, when the harvest is harvested, farmers immediately sell it to the middlemen, and only a small amount is left for the needs of the farmer's household. And this happens over and over again so that when the harvest is expensive and scarce, farmers bite their fingers. The perfection of the calculation of the stock moving average in the food barn for farmers lies in reading market needs, so that this can be done through the coordination of the local KUD

Organize Farming Needs Logistics Planning

Make logistics procurement planning cards for the needs of agricultural production costs such as fertilizers, pesticides, other pesticides, and so on using time series statistics which can be done through a simple application in Microsoft Excel. Calculation of Periodic Series, can be done through local KUD coordination

Calculation of Business Mathematics at each Farmer's Food Barn as Central Profit

The result of the mathematical calculation of business as a central profit is to use a matrix of order two, namely the results of selling the open and close system from the moving average method, minus production costs for farmers in each food barn from the time series method. Central profit must be legally connected to the KUD where the farmer is registered as a member. With the aim of the second order matrix of each central profit can be monitored in the agricultural statistical logistics data space to be able to help farmers maintain farming performance and productivity.

The selling price at the development of the official price used in the second order matrix can be seen from the KUD price catalog. The purpose of calculating the second order matrix is for social security guarantees, in which the condition of farmers who lose money can be known by the KUD where farmers are registered, to find a solution through the integration space in the ministry of agriculture.

Information Integration in viewing Maping area to look for a red line is the most important part to find the source of the root cause of the problem. For this reason, related to the problem of inflation, each region is always required to provide information on the rate of changes in prices for necessities in their respective regions in their statistical space through reporting on the CPI (consumer price index), as well as reporting on other factors that show price increases that have an impact. The information integration section is part of the management information system (MIS). (Patience, ethics, 2022)

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Mathematical calculation of business for each farmer's food barn in the form of fruit and vegetable harvests as central profit

The results of moving average calculations for vegetable and fruit farmers guide farmers to make sales targets in the optimization space to avoid falling selling prices after the main harvest and the crops are not rotten. The sales target set with the moving average is not to be directed at an open and close selling system, but is emphasized when the sales target does not cause damage to crop yields, aka rot. For this reason, the moving average method must be accompanied by: 1) innovative technology for the production of fruit and vegetable crops, 2) marketing business mathematics using the method of reading sales trends in market spaces, and 3) linking farmers themselves with marketing links in the stakeholder space they have literacy and reference from the KUD where the farmer is registered.

Marketing planning by opening market segments through detection space using simple comparisons at each other's marketing locations as well as product innovation related to optimizing agricultural product yields is very suitable for fruit and vegetable crop farmers, which have a very fast expiry period.

Post-harvest losses that stagnate in the inventory turnover of the main harvest if the expected selling price is maintained.

In this case the variables being tested as a method of anticipating post-harvest losses for fruit and vegetable farmers at selling prices that do not cover agricultural production costs through simple comparisons at each other's marketing locations use simulation numbers, which are tested as follows:

Table of Experimental Trials 2.2.4.a

PENJUALAN									
ke Pasar		Ke Bulog		Ke Pedagang		ke Perusahaan		ke MEDSOS	
Hari	Ton	Hari	Ton	Hari	Ton	Hari	Ton	Hari	Ton
1	5	1	0	1	5	1	0	1	1
2	5	2	0	2	5	2	0	2	1
3	5	3	0	3	5	3	0	3	1
4	5	4	0	4	5	4	0	4	1
5	5	5	0	5	5	5	0	5	2
6	5	6	0	6	5	6	0	6	3
7	5	7	0	7	5	7	0	7	3
8	5	8	0	8	5	8	0	8	4
9	5	9	0	9	5	9	0	9	5
10	5	10	0	10	5	10	0	10	6
11	5	11	0	11	5	11	0	11	1
12	10	12	0	12	0	12	0	12	1
13	5	13	0	13	0	13	0	13	1
14	4	14	0	14	2	14	0	14	1
15	3	15	0	15	5	15	0	15	1
16	5	16	0	16	0	16	0	16	1
17	10	17	0	17	0	17	0	17	2
18	20	18	0	18	0	18	0	18	1
19	2	19	0	19	0	19	0	19	2
20	1	20	0	20	0	20	0	20	1
21	6	21	0	21	5	21	0	21	1
22	2	22	0	22	0	22	0	22	1
23	2	23	0	23	5	23	0	23	1
24	2	24	0	24	0	24	0	24	1
25	5	25	0	25	0	25	0	25	1
26	2	26	0	26	0	26	0	26	3
27	2	27	0	27	5	27	0	27	2
28	2	28	0	28	5	28	0	28	1
29	5	29	0	29	5	29	0	29	1
30	2	30	0	30	5	30	0	30	1
31	5	31	0	31	5	31	0	31	1
Terjual	**150**		**0**		**97**		**0**		**53**

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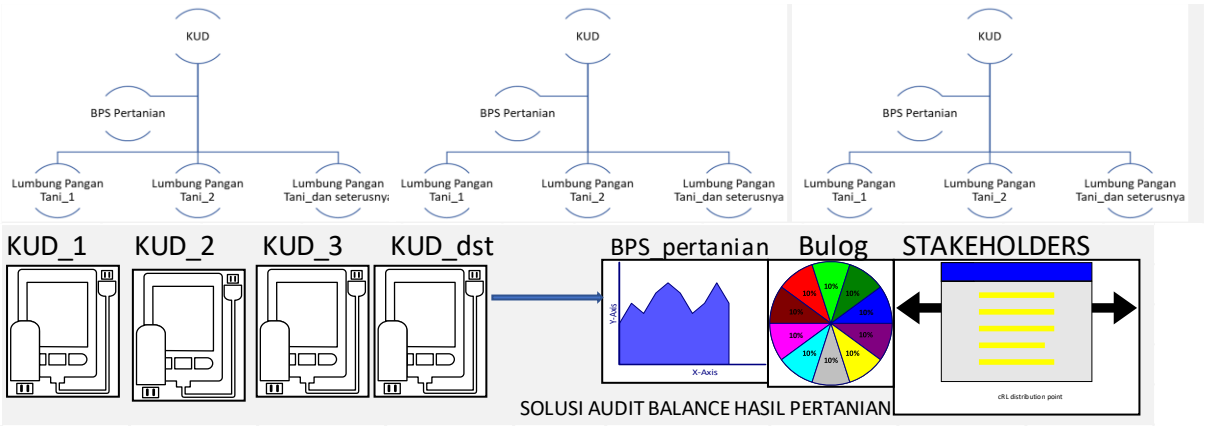
Table of Experimental Trials 2.2.4.b

Hasil Panen_Sayur	300	Ton
Masa Kadaluarsa	1	Bulan
Target Penjualan	300	Ton
Bulan Panen	Januari	
Perbandingan Sederhana Penjulan Yang Tercapai		
Pasar	150	50%
Pedagang	97	32%
Ke Medsos	53	18%
	300	Ton

Results of Data Processing simulation figures in the experimental test room show that the market potential of each marketing location is 50% market, 32% to traders, and 18% to Social Media, assuming a 300 ton vegetable harvest is sold out in one month, with a month old of 31 days on simple comparison calculations . In this simple calculation, farmers have a customer compass and can read market potential that must be developed through the literacy and reference space owned by KUD where farmers are registered as members.

Second Rhetoric

The system of opening and closing sales carried out by farmers by creating food barns in their own homes, must be known by BPS agricultural statistics so that the national rice supply in the GDP (Gross Domestic Product) record is not disturbed by the system for recording and calculating it. Therefore they (farmers) must be integrated by KUD (Village Unit Cooperative).



Village Unit Cooperatives (KUD) are organizations that are socio-economic in form and are a vehicle for rural communities to achieve their hopes of improving their welfare, at the social, economic and cultural levels. Village Unit Cooperatives (KUD) are economic institutions that can assist farmers in procuring agricultural production facilities, capital and guaranteeing the marketing of agricultural production whose implementation is based on a democratic system from the community, by the community and for the community. Based on this, the KUD is a vehicle for farmers to achieve their hopes in order to increase agricultural production while increasing the welfare of farmers in rural areas (Bahua, MI, 2015).

Thus the results of calculations carried out jointly with farmers, KUD, Ministry of Agriculture and Plantations, as well as the appointed banking party to ensure:

1) Uniformity of the selling price of farmers' produce, to the next producer as a buyer,
2) The condition is that farmers do not or are difficult to manipulate the price by middlemen who want to make big profits.

3) The agreement on the open and close system when farmers sell and don't sell must go through assistance and supervision, so that a.) it does not damage the logistics procurement system in the market which is regulated by the Ministry of Trade and BULOG, and b.) does not cause a shortage of goods on the market
4) Farmers don't bite their fingers when crops are scarce on the market until stocks are available during the main harvest, where the selling price will be better for the producers who sell these agricultural products.
5) Farmers and plantations can reduce the risk that the selling price drops drastically and cannot cover production costs during the main harvest due to abundant stocks. This risk can be reduced through discussion and cooperation links so that the selling price of these supplies can be maintained to provide benefits for farmers, and buyers do not choose to buy imported agricultural and plantation products which may be cheaper. The method used is cross-checking the moving average count on the harvest to determine the system policy for opening and closing the farmer's granary when selling the crop. This method will be equipped with techniques for storing crops properly and not rotting in food storages, as well as links or collaborations related to crop marketing or product innovation.
6) For plantation products that have a shorter shelf life for crops such as vegetables and fruit, it is very risky to calculate the moving average which is intended for open-close system sales. The moving average is only done to be able to find out the safe capacity of the harvest while waiting for it to be sold, so that the selling price can be prevented from dropping drastically while preventing the crops from spoiling. This method is complemented by a link or collaboration related to the marketing of crops which can only be carried out through institutional structures, product innovation and assistance with mathematical calculations related to marketing by mmake a marketing plan by opening market segments through the detection room using statistical comparisons of product locations marketed to one another

The results of the calculations carried out by the KUD are a tool to help farmers implement a policy of opening and closing sales and no longer suffer losses during the post-harvest season when the selling price drops. This method also helps the performance of KUD as a liaison for BPS statistics to collect important data for use by many parties in various fields, especially the Ministry of Trade, BULOG, and the Ministry of Finance, to ensure that farmer performance is safe in relation to agricultural productivity through data integration space.

Data integration space to maintain the stability of economic growth among farmers, created through SIM.

Management Information System (MIS) is a planning system part of the internal control of a business which includes the use of people, documents, technology and procedures by management accounting to solve business problems, such as product costs, services or business strategies (Hartoyo, Tri, Hazis, 2015)

The performance of food storages from farmers who are connected by KUD is continued by the following work and business chains for stakeholders related to the flow of agricultural and plantation products applying the Accounting Information System (SIA) which is built from business mathematics in agriculture and plantations.

Accounting Information System is an organizational component that collects, classifies, processes, analyzes and communicates financial information and decision-making that is relevant to outsiders of the company and external parties (Priyambodo, Esa, 2014)

The basis for the development of management information systems and accounting information systems in agricultural product performance innovation is in the second order

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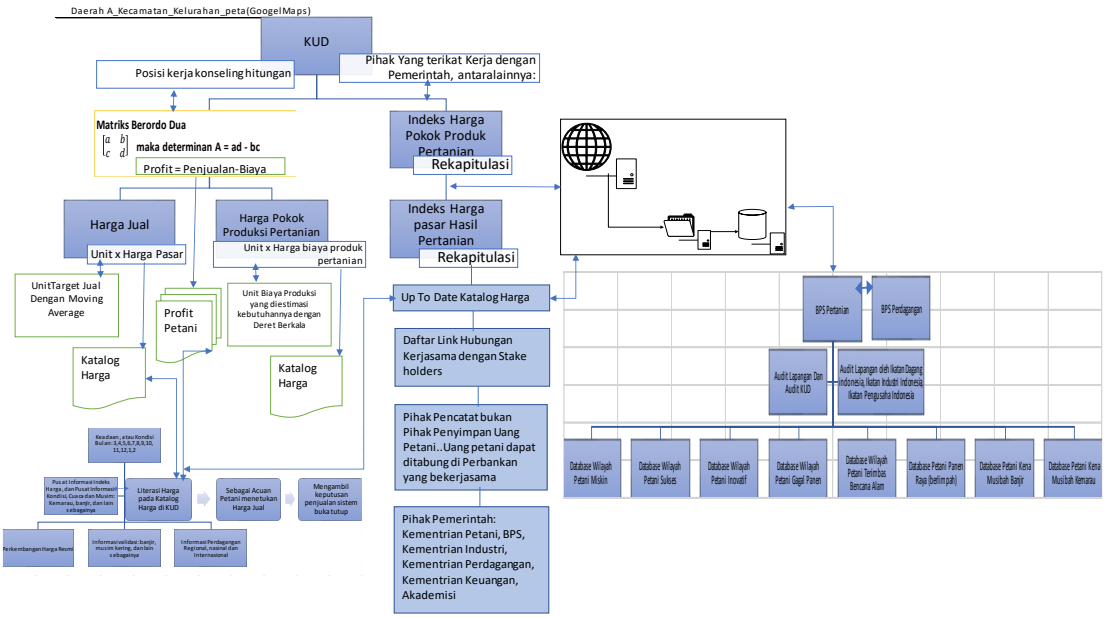
matrix space which is processed by KUD where farmers are registered. The aim is to facilitate decision making from the government related to subsidized fertilizer assistance, BLT, monitoring national food stocks, maintaining and increasing the number of natural management workers through agriculture, one of which is, so that the problem of unemployed workers is due to the unbalanced number of work skills in the social and economic sectors. exata can also be overcome.



Thus scholars will come to villages or centers of economic growth in the field of food processing from the first source, namely agriculture and plantations.

Conclusion

Inflation is part of the world's problems that always exist and become homework every year. Many problem solving methods have been developed in dealing with inflation to form an encyclopedia of solutions. However, this problem remains viral because the problem is only solved in the box workspace. In the era where data is already integrated, one of the things that need to be integrated is the performance and productivity of agriculture and plantations. There are many problems faced by farmers, one of which is the rising price of fertilizer and the selling price of cheap crops, thus disappointing the farmers. The application of theory in cases is the development space in finding problem solving that is already very familiar in strategic thinking. An integral part of its attributes or components is business mathematics, SIM, SIA, and databases. and sharing in the course of socialization. The way to overcome farmers' problems during inflation, famine due to crop failure and post-harvest situations is to apply the business mathematics developed in the harvest inventory space which is directed at the food barn using the moving average method which directs farmers to carry out a wise open and close system on crop yields. which has a long enough life from expiration, and directs farmers, especially vegetables and fruit, to have sales targets through the moving average method equipped with mathematical comparisons in each sales space as well as product innovation to avoid falling selling prices and creating losses for farmers. Besides that, business mathematics with the time series method in the space for production cost requirements is to forecast production cost needs for further productivity. Then the business mathematics in the revenue and cost space is found

using a second order matrix whose calculations are carried out in synergy through the KUD where farmers are registered. This aims to guarantee farmers to be able to remain productive.

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